

**Analysis of the Pedagogical Educational Model vs. the Andragogical  
Educational Model in Fire Officer Education**

STRATEGIC MANAGEMENT OF CHANGE

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## **ABSTRACT**

Traditionally in the state of North Carolina fire officers are educated using the pedagogical educational model. The pedagogical model is instructor-centered that requires the instructor to take full responsibility for the learning. This pedagogical model is primarily used to teach children. The andragogical educational model is a self-directed approach to teaching adults. Educating fire officers using the andragogical model will allow for creative and critical thinking skills by employing a problem-based approach to the instruction.

The purpose of this applied research project was to analyze the probability of success of the pedagogical vs. the andragogical educational models in fire officer management education. Overall, many firefighters have not flourished in the traditional pedagogical style of education and as adults, they begin educational programs with a great deal of trepidation if at all. The descriptive research method was used to answer the following research questions.

1. What are the academic preparations and characteristics of the Fire Protection Technology student?
2. What is the range of cognitive performance for the fire protection students entering the degree program?
3. Which educational system would best train fire officers?

The procedures used to complete this research included a literature review, a questionnaire, and researching admissions data research and students' transcripts

The results of this research included questioning fire students about their academic preparations and characteristics, checking admissions data regarding student placement scores and courses transferred, and grade distribution of student grades for one fire management course.

The recommendations of this research project included requiring instructors to become knowledgeable with the andragogical educational model and requiring the program director to offer training for fire instructors in the andragogical model. Instructors must make the classroom environment conducive for learning using this new model. Instructors must treat students as competent professionals, and finally instructors must provide a safe environment for the students to learn while encouraging participation.

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## **Introduction**

The purpose of this applied research project was to analyze the probability of success of the pedagogical vs. the andragogical educational models in the fire officer management education at Durham Technical Community College in Durham, North Carolina. Pedagogy is traditionally an educational model that is used to teach children. This model is instructor-centered that requires the instructor to take full responsibility for the learning. Previously fire officer-education programs at Durham Technical Community College were based on this pedagogical model. Overall, many firefighters have not flourished in the traditional pedagogical style of education and as adults, they begin educational programs with a great deal of trepidation if at all.

The problem is that many firefighters have been educated under the pedagogical model and thus many lack the ability to be creative thinkers and do not possess critical thinking skills beyond those required on the fire ground. Historically, little officer training has been conducted within the North Carolina Fire Service except that which has been directed at strategy and tactics on the fire ground. Many fire departments do not adequately prepare a line firefighter for the transition to company officer. Little effort and resources are funneled towards supervisory, management, or leadership training. These officers develop training and skills in strategy and tactics; however, these same officers find themselves unprepared to deal with the political issues inherent in modern fire service. The modern fire service is plagued with innumerable problems that

include reorganization, hiring, promotions, funding, downsizing, and requests for new and varied types of service.

The role of the fire service in North Carolina is changing. The fire service has become a complex, technical field and all firefighters should possess higher-order cognitive skills beyond those obtained in the high school (Figueroa, Del Buono, 1994). The fire officer of today and the future will require additional formal education beyond high school in order to discuss topics and issues with engineers, architects, health care professionals, city managers, and an ever increasing educated public. As citizens are becoming better educated, they are asking probing questions regarding the services they are receiving from their governmental services and holding the departments that deliver these services more accountable. As litigation becomes the wave that never seems to crash in our country, the fire service, as other municipal departments, is facing increased litigation. If for this reason only, fire officers must be as well educated as the citizens whom they serve.

Fire service officers must have broad management skills in order to carry out their duties in today's diverse and changing environment. How these officers manage and interact with current firefighters will form the foundation of future fire service in North Carolina.

The descriptive research method was used to answer the following research questions.

1. What are the academic preparations and characteristics of the Fire Protection Technology student?

2. What is the range of cognitive performance for the fire protection students entering the degree program?
3. Which educational system would best train fire officers?

### **Background and Significance**

Improper education and leadership preparation of the fire service officer have created organizational problems such as increased grievances from subordinates, substandard individual and company performance, an increase in accidents and injuries, lack of understanding and poor implementation of departmental policies, and low public perception of the department (Estepp, 1990).

Because the fire service has many management demands that are particular to this field, specialized training of officers is needed. Newly promoted officers must supervise former colleagues. These officers must live with their subordinates during their assigned shifts that are usually 24 hours in duration. Fire officers must foster a team spirit while establishing strong disciplinary procedures both on and off the fireground. They must establish training for their firefighters in order to develop and maintain a variety of technical competencies. New officers must understand that the labor/employer relationship is not comparable to that in other occupations. These officers will need to have the knowledge and ability to interact with a public that experiences crisis situations. Analyzing productivity is difficult in the fire service due to its nonprofit nature, and officers must understand this challenge within this environment.

A great deal of tax revenue is allocated to the fire service. The fire service is a labor-intensive occupation that uses equipment that is costly to taxpayers. Currently there is not an effective means of measuring the service provided relative to the cost of operations. Officers can only be cost effective with personnel through training in allocation of resources as related to cost. Without proper supervisory/management education and training, new officers will have difficulty carrying out cost-effective directives, determining their roles, and implementing these roles in their new positions.

*Pedagogue* is traditionally an educational method that is instructor-centered, which requires the instructor to take full responsibility for the learning. Knowles, in his book *Modern Practice of Adult Education* (Knowles, 1980) states the following regarding his assumptions on pedagogy:

The role of the learner is, by definition, a dependent one. The teacher is expected by society to take full responsibility for determining what is to be learned, when it is to be learned, how it is to be learned, and if it has been learned.

The experience learners bring to a learning situation is of little worth. It may be used as a starting point, but the experience from which learners will gain the most is that of the teacher, the textbook writer, the audiovisual aid producer, and other experts. Accordingly, the primary techniques in education are transmittal techniques – lecture, assigned reading, AV presentations.

People are ready to learn whatever society (especially the school) says they ought to learn, provided the pressures on them (like fear of failure) are great enough. Most people of the same age are ready to learn the same things. Therefore, learning should be organized into a fairly standardized curriculum, with a uniform step-by step progression for all learners.

Learners see education as a process of acquiring subject matter content, most of which they understand will be useful only at a later time in life.



Accordingly, the curriculum should be organized into subject matter units (e.g., courses), which follow the logic of the subject (e.g., from ancient to modern history, from simple to complex mathematics or science). People are subject-centered in their orientation to learning. (pp. 43-44)

Pedagogical learning was based on the transmittal of knowledge and skills through lectures, quizzes, memorization of facts, and examinations (Knowles, 1980). Instructors teaching adults using the pedagogical model found adults to be resistant to these prescribed, rigid strategies (Knowles, 1980). Alternatively, Knowles (1980) states the following about the andragogical approach to education:

It is the normal aspect of the process of maturation for a person to move from dependency toward increasing self-directedness, but at different rates for different people and in different dimensions of life. Teachers have a responsibility to encourage and nurture this movement. Adults have a deep psychological need to be generally self-directing, although they may be dependent in particular temporary situations.

As people grow and develop they accumulate an increasing reservoir of experience that becomes an increasingly rich resource for learning – for themselves and for others. Furthermore, people attach more meaning to learning they gain from experience than those they acquire passively. Accordingly, the primary techniques in education are experiential techniques – laboratory experiments, discussion, problem-solving cases, simulation exercises, field experience, and the like.

People become ready to learn something when they experience a need to learn it in order to cope more satisfyingly with real-life tasks or problems. The educator has a responsibility to create conditions and provide tools and procedures for helping learners discover their “needs to know.” And learning programs should be organized around life-application categories and sequenced according to the learners’ readiness to learn.

Learners see education as a process of developing increased competence to achieve their full potential in life. They want to be able to apply whatever knowledge and skill they gain today to living more effectively tomorrow. Accordingly, learning experiences should be organized around competency-development categories. People are performance-centered in their orientation to learning. (pp. 43-44)

Instructors should teach from a problem-based approach. Problem posing by instructors brings meaning to learning, enhances creativity, and stimulates reflection (Guffey, Rampp, & Masters, 1998). This problem-based approach allows the adult student to maintain a certain amount of control over his or her education. For individuals to be self-directed learners, they should be critical thinkers (Garrison, 1997). Unfortunately, many individuals seeking the fire degree using this self-directed method have only been exposed to the traditional pedagogical style of learning and may find the process of self-direction overwhelming.

Adults learn best when new information can be tied to past experiences and knowledge. When adults encounter new information, they begin to find a reasonable fit between what they already know and what confronts them. Prior knowledge and ways of thinking form the basis of each learner's approach to any new content and provide a window into thinking (Pratt, 1998). In addition, Merriam and Caffarella (1991) discuss the clustering of information that was developed by G. E. Spears. Information is gathered through one set of activities (one cluster). This information is then stored and when needed, is added to another cluster and so on.

Merriam and Caffarella (1991) discuss the scheme theory and describe how knowledge is packaged and organized in long-term memory and how this packaging facilitates the use of knowledge in particular ways. This theory assumes that learning is "cumulative in nature – nothing has meaning or is

learned in isolation from prior experience” (Merriam and Cafferella, 1991, p. 171). Accretion is the accumulation of knowledge each day. Tuning is another mode of learning that improves accuracy by slow and gradual change. The final mode is restructuring that is to be used when the new information will not fit into the current schemata.

To change from the pedagogical model to the andragogical model will require a strategic change or paradigm shift of the Fire Protection Technology program from a traditional to the nontraditional educational methods. The Program Director and instructors within the Fire Protection program must manage this change in order for this shift to be effective.

## **REVIEW OF RELATED LITERATURE**

Research and other writings that are relevant to the present study will be considered under two broad headings. This section reviews the literature concerning fire officer development and adult learning theory.

The concept of fire officer development was first discussed by an ad-hoc group in 1966 at the Wingspread Conference that was held in Racine, Wisconsin. This ad-hoc group identified five statements of national significance regarding officer development (Amabili, 1992). The ad-hoc group discussed the development of standards for competency and achievement that were nationally recognized. Amabili, in his paper *Fire Officer Development-An Historical Overview* (Amabili, 1992) states the follow regarding officer development:

1. Professional status begins with education

2. The scope, degree and depth of the educational requirements for efficient functioning of the fire service must be examined
3. Increased mobility at the executive level of the fire service will be important to the achievement of professional status; the career development of the fire executive must be systematic and deliberate
4. Governing bodies and municipal administrators generally do not recognize the need for executive development of the fire officer
5. Fire service labor and management, municipal officers, and administrators must join together if professionalism is to become a reality (pp. 16-18)

Today's fire service officers must be well educated and must understand the political climate/environment in which they work (Estepp, 1990). Many fire departments do not adequately prepare line firefighters for the transition to company officer. While training divisions within fire departments do an admirable job on mandatory and day-to-day topics, they fail to expand the problem-solving and personnel skills of new officers (Kefalas, 1997). The most common weakness of the fire service is not the fire officer's technical ability but the person's management skills--such as supervision, leadership counseling, finance, and communications (Fitzwilliam, 1994). Fitzwilliam states that fire departments with strong programs in supervisory and management training can better meet the challenges of the 1990s and beyond. "If the fire service continues to operate as it did in the 1960s, it is doomed" (Fitzwilliam, 1994, p. 16).

Adult learning theory has traditionally been defined by using principles of pedagogy, a predominantly teacher-centered educational model (Knowles, 1980). It is this pedagogical model that has encompassed the majority of fire education at Durham Technical Community College. In contrast, the

andragogical model is an educational model emphasizing a more active and independent role for the learner. This indicates the model is learner-centered versus instructor-centered thus requiring adults to take responsibility for their own learning.

Within adult learning theory, Merriam and Caffarella (1991) discuss clustering of information, a concept that was developed by G. E. Spears. Spears determined that self-directed learning does not usually occur in a linear manner and discusses the way that information is clustered together for effective learning. The information in one cluster can be learned and then filed away until needed or the cluster can be added to one or more other clusters of activities. Once self-directed learners complete each cluster, they can integrate those clusters.

By using a problem based andragogical model, instructors may provide a more effective means for training adults (Guffey, Ramp, & Masters, 1998). For many adults, learning is best achieved when they have a certain amount of control over their education. Guffey, Ramp, & Masters outline five steps to effective adult learning. The first step involves individuals understanding that learning is possible. Given many students' past academic achievement (or lack thereof), this may be difficult for them to believe. The second step focuses on the concept that learning is a process that builds on past experience. The third step states that adults should plan their learning. This is a foreign concept to many adult learners. The fourth element is that learners must know that assistance is available when help is required. The fifth and final element is the

expectation of change and the anxiety associated with it. Education and training will introduce new concepts and ideas that may push learners away from the comfortable tried and true methods of learning.

Adults tend to learn differently than children. This is primarily due to their life experiences that allows them to think, analyze, and draw conclusions from the material provided. Adults learn best when new information can be tied to past experiences and knowledge (Pratt, 1998). Given the experience levels of most students in the fire program, this foundation of knowledge should make them successful while using the andragogical approach to training. The andragogical approach may not prove effective, however, if the adult learner has no prior knowledge upon which to build. For example, while being trained on the subject of terrorism, few adult learners have experience upon which to draw. Given this constraint, possibly a pedagogical approach may prove more successful in the beginning stages of the learning process.

Regardless of the approach, adult learners should thrive if the material to be learned is relevant to their life and employment. The learning activities must provide the adult learner opportunities to practice, review, and apply this newly gained knowledge in a timely manner.

Adult learning should encompass the three learning domains, which are cognitive, psychomotor, and affective learning. Since all three domains are interrelated, they can provide the adult learner with the opportunity to learn, apply and understand the base of knowledge. "*Cognition* is defined as the study of how individuals receive, store, retrieve, transform, and transmit information"

(Merriam and Caffarella, 1991, p. 159). The processes that take place during instruction within the cognitive domain include recalling information pertinent to the subject being studied and applying the learned information to real life problems.

As previously mentioned, in understanding adult learning, one must recognize the importance of prior knowledge in addition to the new information being acquired. This connection between prior learning and the addition of new information is outlined using the scheme theory. The scheme theory outlines how this information and knowledge is packaged and then organized (Merriam and Caffarella, 1991). This scheme theory is expressed by two types of knowledge; the first is declarative knowledge, which is knowledge the adult learner knows about information and how the information is determined as facts. The second type of knowledge is procedural knowledge, which is the adult learners' ability to perform skills (Merriam and Caffarella, 1991). Three different modes of learning fit the scheme framework. The first is accretion, which is the accumulation of knowledge each day. The second is tuning, which will help to improve accuracy. The third is restructuring; this is used when new information does not fit the current schemata (Merriam and Caffarella, 1991). Garrison states the importance for adults using the self-directed model develop critical thinking skills (Garrison, 1997). The critical thinking skills will assist firefighters in overcoming the new and varied situations that will continue to develop in the fire service today.

## **PROCEDURES**

Descriptive research was employed to characterize the respondents in the sample and the information gleaned from the admissions data at Durham Technical Community College. The primary purpose of this project was to determine whether a relationship exists between past academic achievement and the probability of success under the andragogical educational model.

The target population for this study consisted of students currently enrolled in the Fire Protection Technology degree program at Durham Technical Community College. The sample consisted of a total of 75 students of which 56 students returned questionnaires. The sample size is considered more than adequate.

The data was collected in three parts: Part I yielded student background information regarding academic preparation and external factors, Part II yielded transfer and development courses that were collected from the admissions data, Part III yielded grade distributions for one course in the fire management certificate.

### **Literature Review**

The literature review was initiated at Durham Technical Community College's Learning Resource Center and at the D. H. Hill Library at North Carolina State University. It continued through the use of North Carolina Live that facilitates the electronic gathering of research. The literature review targeted journal, magazines and textbooks that contained information on pedagogy,



andragogy, and adult learning theory. These resources were summarized and are included in the literature review section of this study.

### Research Methodology

One questionnaire (Appendix A) was developed and administered to students in the Fire Protection program. Additional data was gathered from admissions information at Durham Technical Community College. Seventy-five questionnaires were sent to fire students enrolled in the Fire Protection Technology Degree program. Of the 75 questionnaires sent to fire students, 56 questionnaires were returned. The questionnaire examined the following student information: highest degree earned, major field of study, grade point average, college credit earned, type of institution attended, student status at the institution where the highest degree was earned, and student status in the fire protection program. The data that was obtained from the admission officer and student records is outlined as follows (Appendix B and C):

- number of students accepted into the Fire Protection Technology program,
- the number of students accepted into the Fire Protection Technology program that are coded developmental,
- college English and math courses transferred into Durham Technical Community College,
- college English and Math courses needed and developmental courses required.
- grade distribution for a fire management course.

### Assumptions

The procedures employed in this research project were based on (three) assumptions. The first assumption is that there are significant differences between pedagogy and andragogy in educating adults. The second assumption

is that the andragogical education mode offers educational advantages for the adult learner. The third assumption is that the andragogical educational model would more effectively educate fire officers.

### Limitations

The instruments used to collect the data have not undergone validity testing. The individual questionnaire items were all based on previous research. Additionally, this information is subject to the pitfalls of any self-reported data: Reliance on respondent's memories can be dubious. For example, GPAs are subject to inflation by respondents.

Cognitive performance in the COMPASS (Computer Adaptive Placement Assessment and Support System) placement test for the Fire Protection Technology program was measured by only three test scores. It is possible that there are additional measures of cognitive performance that could enhance the picture of a student's performance. There may be universal social events out of the control of the researcher that affect the way students perform on the COMPASS placement test.

## **RESULTS**

### **Answers to Research Questions**

Research Question 1. What are the academic preparations and characteristics of the Fire Protection Technology student? The one variable in the present study is "academic preparation" of the student prior to and then being newly admitted into the Associates degree in Fire Protection in order to ascertain cognitive ability. The variable academic preparation had several components as

reflected in research question one. The academic preparation variable was comprised of the following data components: highest degree earned, number of hours completed toward an incomplete degree, academic major, grade point average, type of institution where the highest degree was earned, student status at the institution where the highest degree was earned and student status after completing the COMPASS test.

Of the 75 questionnaires sent to fire protection curriculum students 56 were returned. Item one on the questionnaire – highest degree achieved – was high school diploma/GED, which was indicated by 36 of the 56 respondents. Ten of the samples reported having an associate's degree. Nine indicated having a bachelor's degree, while one indicated having earned the master degree.

For questionnaire item two respondents indicated their academic major field of study. Students who earned college degrees reported having a variety of academic majors. Of the 20 students who reported earning a college degree (Associate's or better), six reported having a major in a vocational technology type field, two in Liberal Arts, four in social science, seven in the social professions, and one in the natural sciences.

Grade point average (GPA) was asked only of the trainees who reported earning a degree beyond a high school diploma. On those, zero reported a GPA from where they earned their highest degree of 2.0 – 2.5 on a four-point scale, three reported a GPA of 2.51 – 3.0; nine reported a GPA of 3.01 – 3.5 and the remaining 8 reported a GPA of 3.51 – 4.0.

For another dimension of the academic preparation, students were asked to report the number of hours they completed (if any) towards a degree that they had not yet earned. Forty of the 56 respondents reported having completed some hours towards a higher degree. The range of responses for this item was from 3 to 120 hours. Of the 40 respondents indicated having completed some college work, 20 completed from 3 – 12 hours, 10 completed from 13 – 24 hours, 4 completed from 25 – 50 hours and 6 completed from 50 – 75 hours. None of the 40 respondents indicated completing more than 75 hours.

For questionnaire item five, respondents reported the type of institution where their highest degree was earned. Of the 56 respondents, 44 indicated having earned their highest degree from a public educational institution, while the remaining 12 indicated their highest degree was from a private educational institution. More specifically, 30 of the respondents indicated having earned a high school diploma or a GED from a public school. Six respondents indicated having earned a high school diploma from a private or parochial high school. Ten respondents attended a public community or junior college. Four indicated having attended a public four-year college or university while the remaining six attended a private four-year college or university.

For survey item six respondents reported their primary student status at the institutions at which their highest degree was earned. Of the 56 respondents 29 indicated attending high school full time, while seven earning the GED attended part time. Of those attending the community or junior college, 10

indicated working on the degree part time. Three respondents attended a four-year college or university full time while seven attended on a part time basis.

Fire Protection Technology students are required to take the COMPASS placement exam prior to admission in the Fire Protection Technology program. The COMPASS placement exam measures a student's English, reading and math skills. If a student scores below the cut off for any of the three academic levels than the student is allowed into the fire program and given a developmental status. At this point the developmental student must complete a developmental course or a series of developmental courses (depending on COMPASS scores) in preparation for attempting the college level English and math courses. Of the 56 respondents, 24 reported as being admitted into the fire protection program without the need to take developmental course work, while 32 respondents reported as having a developmental status.

In summary, the average respondent in this study was a graduate of a public high school, who earned their highest degree while attending school as a full-time student and completed some hours towards a college degree. Among respondents who reported having some college or having a college degree, the average respondents received an associate's or bachelor's degree and achieved a grade point average of between 2.51 and 4.0. One respondent in this study reported having completed a master's degree.

Research Question 2. What is the range of cognitive performance for the fire protection students entering the degree program? The admissions variable in this study had several components as reflected in research question two. The

admission variable comprised of the following data components: program acceptance, transfer of an English course, transfer of a math course, required to take English 111, required to take Math 115, developmental status, developmental English, developmental reading, and developmental math.

Seventy-five students are currently admitted into the Fire Protection Technology program either as full program students or under the developmental status. Of the 75 students in the fire protection program 33 are admitted as full program students, while 42 are admitted as developmental students. Of the 33 fully admitted students 18 students have transferred their English from other colleges or universities and eight of the fully admitted students have transferred their math from other colleges or universities.

The COMPASS exam is in reality three separate modules (English, reading, and math). If students score in the developmental range in any one of the three modules then the student is coded as developmental and must complete the required course work. A student may be required to take a developmental math course; however, their English score may be high enough to place the student into the English 111. Another possibility would be that the student might be required to developmental English course(s); however their math score may be high enough to place the student into Math 115. Of the 33 fully admitted students 17 are required to take English 111, while 25 of the 33 fully admitted students are required to take Math 115.

Forty-two students are coded as developmental. Of these 42 developmental students 13 are required to take English 111, but must take

developmental math courses. Of these 42 developmental students 7 must take Math 115, but are required to take developmental English and or reading course(s).

Fourteen developmentally coded students are required to take only one developmental course. Seven developmental students are required to take two developmental courses, while two students are required to take three developmental courses, while sixteen developmentally coded students are required to take four or greater developmental courses.

Research Question 3. Which educational model would best train fire officers? Grade distributions were researched from 1993 until 2001 for one course titled Managing Fire Services, in the fire management certificate within the two-year degree. From 1993 until 1997 the course was taught using the traditional pedagogical model. The grade distributions for this time period are as follows: 23 students earned a grade of "A", 31 the grade of "B", 45 students earned the grade of "C", 15 the grade of "D", while 4 students earned a failing grade.

From 1998 until 2001 the andragogical model was employed to teach the course Managing Fire Services. The grade distributions for this time period are as follows: 45 students earned a grade of "A", 40 earned the grade of "B", 23 students earned a "C", while 8 earned the grade of "D", while 3 earned a failing grade.

## **DISCUSSION**

The results of the study revealed that given relatively low academic preparation instructing adult firefighters, using the andragogical model appears to be very effective in educating fire officers. Reviewing the student grades of the management course for the time period that the pedagogical model was used to provide instruction versus the student grades of when the andragogical model was used to provide instruction shows an increase in the success rate of student grades.

A majority of firefighters enter the fire service because of their strong tactile ability, while many of these same individuals have not demonstrated strong academic achievement in past academic endeavors. These individuals have not flourished in a traditional pedagogical style of education and as adults, they begin educational programs with a great deal of trepidation. These observations have been made by the researcher who has been counseling, advising, and teaching firefighters in the Fire Protection Technology degree program at Durham Technical Community College for eight years. In addition, he has been teaching firefighter certification courses for fifteen years and has served as a line firefighter for twenty-four years. Many firefighters express concern, fear, and uncertainty about attending educational programs. The concerns most often expressed by firefighters involve the issue of returning to school after many years of nonattendance and previous low academic achievement. Adults may underestimate their ability to learn, and this lack of confidence may prevent them from applying themselves wholly.



This paper suggests employing a different approach to the problem of low academic skill in fire officer education. By utilizing andragogical rather the pedagogical instructional methodologies given the fact that a large number of firefighters do not have proper English skill or have little ability to perform mid to advance mathematical computations, improvements should occur. Adult learners do not learn well until they realize they have a certain amount of control over their educational outcomes. In advocating this paradigm shift, instructors within the fire program must assist firefighters in understanding that learning is possible and that it is possible to move on to a higher level of achievement. Adults tend to define themselves largely by their experiences. When they find themselves in situations in which their experiences are not being used, or their worth is minimized, it is not just their experiences that are being rejected, but they may feel rejected as persons as well.

The student must accept that learning is not the full responsibility of the instructor; rather it is the responsibility of the adult learner. In the case of the management course students understand that learning is a developmental process that builds on previous knowledge. Instructors establish a safe environment where students can learn and students know that assistance is available both inside and outside the classroom. The instructor's relationship to the student is one of a facilitator and not a disseminator of knowledge.

Students taking the management course using andragogical method realized that they have many skills and knowledge, and they see themselves as active participants in their own educational process. The management course

was for many their first introduction to self-directed learning. In the beginning of the course, it was discovered that the students needed to develop a deeper self-concept, more confidence, more sense of direction, and a greater ability to work with other. As the semester progressed, they learned to identify and value their own experiences in life and to value the experiences of others. They began to develop critical thinking skills by working through problem-based instruction.

The community college's open door philosophy (unlike the philosophy of traditional four-year colleges and universities) states that community colleges will accept students at any academic level and begin the educational process at that point. Instructors must teach students with a wide range of academic skills and preparation as the admissions data and COMPASS scores indicated.

### **RECOMMENDATIONS**

The data showed that improvements in student grades did occur when the andragogical model was employed for the fire management course. In many cases academic preparation was low, yet students overall responded well to this andragogical model. Improvements by the students were sufficient to continue to develop additional course work using this model. Based on this research the following recommendations are made for the implementation for additional course work using this model:

1. Instructors must feel comfortable and must be knowledgeable with not only the subject matter they will be teaching but also with the andragogical model. Instructors will discover that additional planning, preparation and effort is required for the andragogical model to be effective in the classroom.

2. The director of the fire protection degree program must screen instructors to determine if they have the desire and the capability of teaching using this self-directed method. Many instructors teach in the same way they were taught. The program director must offer training programs to instructors in the general concept of the andragogical model and then the group can then brainstorm on teaching techniques and ways to teach their course using this model. This model requires a variety of learning strategies to stimulate learning because adults have different learning styles.

3. Instructors must make the classroom environment conducive for students to learn in this way. Sitting and being lectured to tends to turn adult students off. Instructors must give the adult student a sense of self-worth that would assist them to think and see things for themselves. Instructors will have to encourage and support students in this new approach to education.

4. Mutual respect must be established between the instructor and students within the class. Instructors must treat adult students as competent professionals. Adults students need some control over what, how, why, when and where their learning will occur. Adult students have a great deal of life experience and knowledge to contribute to the class and this information should not be lost.

5. The instructor must provide a safe environment for the students, that is safe from judgement, while encouraging participation. Instructors must treat individual students with respect and dignity.

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**APPENDIX A**

## Fire Protection Technology Student Questionnaire

Instructions: Please place an "X" in the line beside the appropriate answer(s)

- Indicate the highest degree you earned. {Select only ONE}.

  7   GED

 29  High School Diploma

 10  Associate's Degree

  9  Bachelor's

  1  Master's

2. With regard to the highest degree you earned, indicate your major field of study {Select all that apply}.

If you did not earn a degree beyond high school, skip to item #5.

  6  Vocational Technology

  2  Liberal Arts (English, Humanities, Arts, History, Economics, Languages)

  4  Social Science (Sociology, Psychology, Political Science, Anthropology)

  7  Social Professions (Business, Social Work, Education, Health Professions)

  1  Natural Sciences (Biology, Chemistry, Physics, Agriculture)

  0  Other \_\_\_\_\_

3. Estimate your Grade Point Average (GPA) (on a four-point scale) for the institution at which you earned your highest degree.

In you earned a GED only, skip to item #5.

GPA =	2.0 – 2.5	<u>0</u>
	2.51 – 3.0	<u>3</u>
	3.01 – 3.5	<u>9</u>
	3.51 – 4.0	<u>8</u>

4. If you earned some college credit, but did not earn a degree, indicate how many hours of college credit you earned.

In this does not apply to you, skip to item #5.

Hours of college credit hours:	1 – 12	<u>20</u>
	13 – 24	<u>10</u>
	25 – 50	<u>4</u>
	50 – 75	<u>6</u>
	76 - +	<u>0</u>

5. Indicate the type of institution where you earned your highest degree. (Select only ONE)

30 Public high school/GED

6 Private or parochial high school

10 Community, Technical, or Junior College

4 Public four-year college or university

6 Private four-year college or university

0 Other \_\_\_\_\_

6. Indicate your primary student status at the institution at where you earned your highest degree. (Select only ONE)

	Full Time	Part Time
High School/GED	<u>29</u>	<u>7</u>
Community or Junior College	<u>0</u>	<u>10</u>
Four-year College or University	<u>3</u>	<u>7</u>

- Student status in the Fire Protection Technology program completing the ASSET test.

Program Students	<u>24</u>
Developmental Students	<u>32</u>

## APPENDIX B

### STUDENT PROFILE

#### Student Profile KEY

FIP	An individual fully admitted into the Fire Protection Degree program.
TR Eng	Student transferring a college English course into Durham Technical Community College
TR Math	Student transferring a college math course into Durham Technical Community College
Eng 111	Student required taking English 111 Expository Writing
Math 111	Student required taking Math 115 Mathematical Models
Dev.	Student admitted into the Fire Protection Degree program coded as a developmental student.
Dev Eng	Student required taking developmental English course(s) Eng 70 Basic Language skills, Eng 80 Writing Foundations, Eng 90 Composition Strategies
Dev Read	Student required taking developmental reading course(s) Read 70 Essential Reading Skills, Read 80 Introduction to College Reading, Read 90 Improved College Reading
Dev Math	Student required taking developmental math course(s) Math 50 Basic Math Skills, Math 60 Essential Mathematics, Math 70 Introductory Algebra

#	FIP	TR Eng	TR Math	Eng 111	Math 115	Dev	Dev Eng	Dev Read	Dev Math
1	X			X	X				
2	X	X			X				
3	X			X	X				
4						X	70, 80, 90,	80, 90	50, 60, 70
5	X	X			X				
6				X		X			60, 70
7	X			X	X				
8	X			X	X				
9						X	80, 90	80, 90	60, 70
10	X	X	X						
11	X	X	X						
12	X	X			X				
13						X	80, 90	90	70
14						X	70, 80, 90		70
15	X	X	X						
16	X	X			X				
17	X	X	X						
18		X				X			70
19						X	90	90	50, 60, 70
20	X	X			X				
21	X	X			X				
22						X	90	90	50, 60, 70



#	FIP	TR Eng	TR Math	Eng 111	Math 115	Dev	Dev Eng	Dev Read	Dev Math
23						X	80, 90	60, 70	50, 60, 70
24		X				X			60, 70
25	X	X	X						
26	X			X	X				
27	X	X			X				
28	X	X	X						
29						X	90	70, 80, 90	70
30				X		X			70
31				X		X			70
32				X		X			70
33	X			X	X				
34	X			X	X				
35	X			X	X				
36	X			X	X				
37	X			X	X				
38	X			X	X				
39						X	80, 90		70
40						X	90		70
41	X			X	X				
42	X			X	X				
43	X			X	X				
44				X		X			70
45				X		X			70
46				X		X			70
47	X	X			X				
48	X	X	X						
49				X		X			70
50						X	80, 90	70, 80, 90	50, 60, 70
51						X	80, 90	90	70
52						X	90		70
53						X	80, 90	70, 80, 90	50, 60, 70
54						X	90	90	70
55						X	90	80, 90	60, 70
56						X	80, 90	70, 80, 90	50, 60, 70
57					X	X	90		
58					X	X	90		
59				X		X			70
60					X	X	80, 90		
61					X	X	90		
62					X	X	90		
63						X	80, 90		60, 70
64	X	X	X						
65						X	70, 80, 90	80, 90	50, 60, 70

#	FIP	TR Eng	TR Math	Eng 111	Math 115	Dev	Dev Eng	Dev Read	Dev Math
66	X			X	X				
67					X	X	90		
68				X		X			60, 70
69				X		X			60, 70
70	X			X	X				
71	X			X	X				
72				X		X			70
73					X	X	80, 90		
74				X		X			70
75						X	70, 80, 90	70, 80, 90	50, 60, 70

## APPENDIX C

### Grades Distributions

Managing Fire Services

Pedagogical Educational Model

<u>Years</u>	<u>Grade</u>	<u>Number of Students</u>
1993 – 1997	A	23
	B	31
	C	45
	D	15
	F	4

Managing Fire Services

Andragogical Educational Model

<u>Years</u>	<u>Grade</u>	<u>Number of Students</u>
1998 - 2001	A	45
	B	40
	C	23
	D	8
	F	3